

CLAIMS

1. A water supply system for supplying water to a building including
a water tank for collecting water from the roof and gutters of the building;
5 a water level sensor means for sensing the level of water in the water tank;
a tank water system for supplying water from the water tank;
a water pump for pumping water from the water tank along the tank water
system;
a non-return valve downstream of the pump in the tank water system;
10 a pressure sensor means for sensing water pressure of water within the tank
water system, said pressure sensor means is located downstream of the non-return
valve,
a mains water system for supplying mains water;
a three port valve having a first port connected to the tank water system
15 downstream from the pressure sensor means, a second port connected to the mains
water system and a third port connected to the building's water reticulation system;
wherein when the first and third ports are open the second port is closed and when
the second and third ports are open the first port is closed; and
a control means for operatively receiving inputs from the water level sensor
20 means, pressure sensor means and mains electricity supply and controlling the
water pump and three port valve.
2. A water supply system as claimed in claim 1 wherein the three port valve is a
servo shuttle valve where the opening and closing of the ports is controlled by an

electric motor actuated by signals from the control means to switch between mains water and tank water supply.

3. A water supply system as claimed in claim 2 wherein the servo shuttle valve
5 has a shuttle that is moveable by lead screw connected to the output of the motor gearbox, said shuttle is moveable within the shuttle valve housing wherein the first and third ports are open when the second port is closed and the second and third ports are open when the first port is closed.

10 4. A water supply system as claimed in any one of claims 1 to 3 wherein there is an accumulator downstream of the non-return valve but upstream of the three port valve.

5. A water supply system as claimed in any one of claims 2 to 4 wherein there is
15 a mains water system non-return valve upstream of the servo shuttle valve to open and close the mains water supply lines for providing mains water.

6. A water supply system as claimed in claim 5 wherein there is a regulator valve
upstream of the servo shuttle valve and the regulator serves to prevent a change in
20 flow rate between the switching from one water supply source to another.

7. A water supply system as claimed in any one of the abovementioned claims
wherein the control means has two modes of operation including an automatic mode
where the controller automatically chooses the water source from the input signals
25 from the water sensor and pressure sensor with a default setting for using tank

water; and a manual mode of operation where either tank water or mains water may be chosen as the water source at the discretion of an operator.

8. A water supply system as claimed in claim 7 wherein when the control means is in manual mode and low water level is detected in the water tank or there is detection of a pump or mains electricity supply failure, an alarm signal is sent to and displayed by the control means when tank water supply is chosen.

9. A water supply system as claimed in any one of the abovementioned claims wherein the water level sensor and controller are used to detect multiple water levels in the tank.

10. A water supply system as claimed in any one of the abovementioned claims wherein the water sensor means is a floating magnet and used to provide a signal to a magnetic field sensor being a Hall Effect device.

11. A water supply system as claimed in claim 10 wherein the output of the Hall Effect sensor is measured to provide multi-level detection.

12. A water supply system as claimed in any one of the abovementioned claims wherein the water level sensor means includes a multi-level water sensor and water may be reserved for supplying to a special outlet pipe for drinking purposes when the sensor detects that the level is below a predetermined level.

13. A water supply system as claimed in any one of the abovementioned claims wherein the pressure detected by the pressure sensor means is above a preset value, the control means switches off the pump either immediately or after a preset period of continued pumping, wherein pressure is maintained downstream of the non-return valve until water draw off causes it to be lowered, whereupon the pressure sensor will detect this state of lowered pressure and send a signal to the controller to cause the pump to be restarted.

14. A water supply system as claimed in any one of the abovementioned claims wherein when water is detected in the tank by the water level sensor and the operation of the pump does not cause the pressure detected by the pressure sensor to rise then the pump is turned off and the three port valve is switched to deliver mains supply water via the second port to the third outlet port.

15. A water supply system as claimed in any one of the abovementioned claims wherein there is a flow sensor for measuring the rate of flow within the tank water system, said flow sensor is connected to the controller.

16. A water supply system as claimed in any one of the abovementioned claims wherein the controller enables water to be drawn from a tank below a preset threshold level to maintain continuity of supply without the interruption due to the transition of the 3 port valve from one supply source to another.

17. A water supply system as substantially described herein with reference to and as illustrated by the accompanying drawings.